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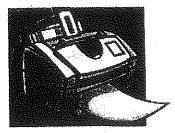
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From: Michael Comingham Office/Phone: 312) 886 - 4464
Office/Phone: 312\ 884 - 4464
Date: 01-08-03 Number of Pages: 8
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PROMOTING CHEMICAL RECYCLING:

Resource Conservation in Chemical Manufacturing





Lessons from the New Jersey Chemical Industry Project --Materials Recycling Team



Scenarios and Regulatory Interpretations June, 1999











Preface

The U.S. Environmental Protection Agency's (EPA) Office of Policy is working with the New Jersey Department of Environmental Protection (NJ DEP) EPA Region 2, and a Stakeholder group made up of industry, environmental groups, union, and community representatives on a project involving the batch chemical manufacturing industry in New Jersey. This project, named the New Jersey Chemical Industry Project, is an effort to assess current environmental protection strategies on a sector basis and develop better approaches.

The project started by asking what inspires companies to achieve--or keeps them from achieving--better environmental performance. From this information, the Stakeholder group developed a list of 45 issues for possible pilot projects to test new environmental protection strategies. The Materials Recycling Pilot was one of four



pilot projects selected by the Stakeholder group. The other pilot selected by the group include: effluent trading of local limits between indirect dischargers, compliance assistance, and flexible track for good performers.

A subset of the Stakeholder group formed the Pilot Team for the Materials Recycling Pilot, along with several additional facility and regulatory experts who were invited to participate. The Pilot Team worked together to identify and define five materials recycling scenarios that are potentially applicable to many batch chemical manufacturers. NJ DEP and EPA staff reviewed the scenarios and determined how the recycling activities envisioned in the scenarios relate to current regulations. Since New Jersey hazardous waste regulations are the same as federal hazardous waste regulations, the information presented here is applicable to facilities in other states where the federal hazardous waste regulations also apply. The Pilot Team anticipates that these scenarios and responses will provide useful information to chemical facilities and other manufacturing facilities that have similiar materials recycling opportunities.

Two facilities on the Pilot Team have already implemented one of the scenarios. The Pilot Team has documented the economic and environmental benefits of the scenario in <u>Appendix A</u>. Another facility is currently trying to identify trading partners for implementing a second scenario.

In addition to this report, the New Jersey Chemical Industry Project has prepared reports on the work of the Effluent Trading Pilot Team, the Compliance Assistance Pilot Team, and the Flexible Track Pilot Team. The Effluent Trading report describes the Pilot Team's experience in implementing the first-ever trade of local pretreatment limits among indirect dischargers. It also provides guidance on how trading of local limits can be established at other publicly-owned treatment works. This report is titled Sharing the Load: Effluent Trading for Indirect Dischargers, EPA 231-R-98-003, May 1998.

The Compliance Assistance report describes how the Pilot Team developed compliance assistance materials for New Jersey companies as an Industry-Government Team. The materials include plain language descriptions of many NJ state environmental regulations and NJ DEP compliance assistance activities, applicability flowcharts for six key regulations, and an extensive bibliography of compliance assistance resources. The cooperative approach allowed the Pilot Team to develop materials that were targeted to industry needs, used less agency resources, and improved relationships between industry and regulators. The report is titled *Inspiring Performance: The Government-Industry Team Approach to Improving Environmental Compliance* (EPA-231-R-99-002, May 1999). The compliance assistance materials that were developed can be viewed on the Internet at http://www.state.nj.us/dep/enforcement/home.htm.

The Pilot Team for the final pilot, Flexible Track, has published a "Proposed Framework For a Flexible Track Program" which has served as the foundation for NJ DEP's Silver and Gold Track Programs Fritters. These programs provide incentives to facilites that are good environmental performers to maintain and improve their performance. The first element of the Silver Track Program was implemented in September 1999. The NJ DEP is continuing to work with a group of stakeholders from

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industry and environmental groups in developing the Silver Track II and Gold Track Programs.

For more information about the New Jersey Chemical Industry Project, the Materials Recycling Pilot, or any of the other Pilots, or to obtain a copy of any of the New Jersey Chemical Industry Project reports, please contact:

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PILOT TEAM MEMBERS

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APPENDIX B: Overview of Project XL

Chapter 7: Scenario 5 APPENDIX C: Letter from EPA Office of Solid Waste Describing Legitimate Recycling Activities

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Pilot Team Members

Overview

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Chapter 7: Scenario 5 A chemical manufacturing facility and a refinery are co-permittees of a private wastewater treatment plant (WWTP). Discharges from the refinery to the WWTP contain organics, including alcohols and other hydrocarbons. These organics are used by the WWTP as a food source (substrate) for the microbes that biodegrade wastewater. The microbes must have a sufficient level of substrate to maintain proper operation of bio-treatment processes at the WWTP. During scheduled and unscheduled downtimes for the refinery, the substrate necessary for bio-treatment must be obtained from other sources because the refinery does not discharge sufficient organics to support the microbial population. Food supplements are also necessary to support the microbial population at other times of the year, for example, during cold weather.

The chemical manufacturer produces alcohols from the manufacture of lubricating oil additives. The manufacturer currently manages these alcohols by phase separating alcohol from wastewater, placing the alcohol into a tank and shipping it offsite to fuel blending operations. The chemical manufacturer would like to send these alcohols to the WWTP, where they could help to maintain a healthy microbial operation and enhance biodegradation of chemical compounds during downtimes for the refinery and other times when food for the microbes is limited.

The alcohols would not require any treatment or processing prior to their use in the WWTP, other than phase separation from the wastewater. The alcohol/wastewater would not be stored for a long enough period of time to be speculatively accumulated (40 CFR 261.1(c)(8)).

The alcohols have been classified as by-products under the RCRA hazardous waste regulations (See Chapter 2, Definition of Terms).

This scenario has already been implemented by two industry members of the Materials Recycling Team. The environmental and economic benefits of this scenario are described in more detail in Appendix A.



Benefits

This scenario would benefit the environment by reusing, rather than discarding, the wastewater alcohols; reducing the use and therefore demand for production of fresh alcohol to help sustain microbes; and improving the functioning of the microbes and the quality of discharges from the WWTP. Both the manufacturing plant and WWTP would also benefit financially -- the manufacturing plant would benefit from avoided treatment and disposal costs for the alcohol, and the WWTP would benefit from avoided purchases of fresh alcohol.

Additional Information

- What is the composition of the alcohol/wastewater mixture from the chemical manufacturer? The alcohol composition changes based on production requirements for the plant. However, ethanol accounts for approximately 50 percent of the alcohol at all times. Other alcohols include isoamyl alcohol, isobutanol, isopropanol, and methyl isobutyl carbinol.
- Does the alcohol/wastewater mixture contain any hazardous constituents or exhibit any hazardous waste characteristics? The alcohol/wastewater mixture may exhibit the characteristic of ignitability, and contains zinc (which is not a RCRA hazardous constituent).
- How is the alcohol transferred from the facility to the WWTP? Alcohols would be initially transferred to the WWTP through a discharge pipe or in tank wagons.

Regulations Involved

• Identification and Listing of Hazardous Waste (40 CFR Part 261)

Questions and Regulatory Response

General Comments

The answers for this scenario are based on the assumption that the alcohol/wastewater mixture is a by-product, as defined in 40 CFR 261.1(c)(3).

Assuming the alcohol/wastewater by-product from the lube oil additive manufacturing process is a characteristic by-product (see definitions), it would not be considered a RCRA solid waste when reclaimed by being phase-separated, pursuant to 261.2(c)(3), provided that the by-product wastewater/alcohol stream: (1) is truly a by-product and not a spent material, (2) is not a listed hazardous waste, and (3) is not used in a manner constituting disposal, burned for energy recovery, or accumulated speculatively.

Once the secondary material is reclaimed (or if the material did not need reclaiming), it is not a solid or hazardous waste if it is an effective substitute for a

commercial product (40 CFR 261.2(e)(1)(ii)) as long as it is not used in a manner constituting disposal, burned for energy recovery, or speculatively accumulated. (40 CFR 261.2(e)(2)).

Questions and Answers

1. Under the current RCRA regulations, can the reclaimed alcohol be used in the WWTP without being regulated as a hazardous waste?

Answer: Yes, if the reclaimed alcohol is an effective substitute and is not used in a manner constituting disposal, burned for energy recovery, or speculatively accumulated. (40 CFR 261.2(e)(1)(ii) and 40 CFR 261.2(e)(2)).

2. Would the regulatory requirements change if it were found that some of the reclaimed alcohols were more beneficial than others in promoting a healthy microbial population?

Answer: No, as long as the reclaimed alcohols are determined to be an effective substitute for commercial alcohols, the regulatory analysis does not change.

3. Would the regulatory situation change if the reclaimed alcohol proved to be a slightly less effective nutrient for WWTP microbes than a specific, purchased alcohol?

Answer: As long as the reclaimed alcohols used are determined to be an effective substitute for a commercial product, the regulatory analysis would not change. Since generators who raise a claim that a certain material is not a solid waste must demonstrate that there is a known market for the material and that they meet the terms of the exclusion or exemption, it is important to document, including testing results, that the alcohol mixture is an effective substrate for enhancing the microbial population or enhancing biotreatment (40 CFR 261.2(f)).

4. Would the regulatory requirements change if the reclaimed alcohols were supplied from another facility, not a co-permittee of the WWTP, and all other factors remained the same?

Answer: No, the hazardous waste regulatory analysis does not depend on the location of generation or use of the material, and thus would not change. The sending facility would need to ensure that the by-product use would be approved by the WWTP.

5. Does the regulatory status of the reclaimed alcohols change for any of the above questions if they were transferred to the WWTP via mobile tank truck instead of being hard-piped?

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Answer: No, the regulatory analysis does not depend on the mode of transport and thus would not change.

6. Does the regulatory status of the reclaimed alcohols depend on whether they are used to augment the organic levels at the WWTP during normal operations or whether they are only used as a substitute for alcohols that would be purchased by the WWTP during downtimes for the refinery?

Answer: No, it does not matter when the alcohols are used. The key to the regulatory analysis is their use as an effective substitute.

7. Would the regulatory requirement change if the WWTP paid for or did not pay for the reclaimed alcohols?

Answer: The regulatory determination would be the same regardless of whether the WWTP pays for the reclaimed alcohols, as long as the activity is legitimate recycling. In determining whether an activity is legitimate recycling, the Agency may take into consideration factors such as the similarity of the secondary material to an analogous raw product, as well as the economic value of the material and the economics of the recycling process (Memo, Lowrance to Regions; April 26, 1989, see Appendix C). Thus, the economic value of the material is considered in the determination of whether the recycling and/or reuse are legitimate recycling and, thus, whether the recycling/reuse exclusions discussed are available for this activity.

8. Would the regulatory situation change if the WWTP only used a small amount of the reclaimed alcohols?

Answer: No, provided that the alcohols are determined to be used as effective substitutes.

9. Under what conditions would the Land Disposal Restrictions (LDRs) apply to this alcohol reuse scenario?

Answer: If the alcohol/wastewater mixture and the reclaimed alcohols are determined not to be solid and hazardous wastes from the point of generation due to the manner in which they are recycled, they are not regulated hazardous wastes and the LDRs do not apply. However, if they are determined to be solid and hazardous wastes, the LDRs may apply.

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Preface

Appendix A

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Benefits of Implementing the Wastewater Alcohol Reuse Scenario

Acknow ledgements

Pilot Team Members A batch chemical manufacturer and wastewater treatment plant (WWTP) implemented the Wastewater Alcohol Reuse scenario for five days in October 1998 when microbial activity at the WWTP was low. During this initial test of the scenario, the chemical manufacturer sent approximately 1,000 gallons of wastewater alcohols to the WWTP instead of disposing of them off-site. The WWTP used these alcohols to stimulate microbial activity instead of purchasing fresh methanol for this purpose.

Chapter 1: Introduction The chemical manufacturer and WWTP plan to implement this scenario on a broader scale in the future. This includes implementing the scenario during additional periods when microbial activity at the WWTP is low, and during month-long shutdowns at the refinery known as "turnarounds."

Chapter 2: Definition of Terms

Chapter 3: Scenario 1 Implementation of the scenario benefits the environment, the WWTP, and the chemical manufacturer. The environment benefits from a reduction in the transportation and off-site disposal of wastewater alcohol, and a reduction in the use and demand for production of fresh methanol. The WWTP and chemical manufacturer both accrue cost savings; the WWTP from avoided purchases of fresh methanol, and the chemical manufacturer from avoided transportation and off-site disposal of the wastewater alcohols. These benefits are summarized in Exhibit A-1 and described further in this appendix.

Chapter 4: Scenario 2

Chapter 5: Scenario 3 In addition to the facilities that have already tested the Wastewater Alcohol Reuse scenario, implementation of the scenario would likely benefit other chemical manufacturers, WWTPs, and publicly-owned treatment works (POTWs). Chemical manufacturers most likely to benefit from the scenario are those that are currently sending wastewater alcohols off-site for disposal. Wastewater treatment plants and POTWs most likely to benefit from the scenario are those that purchase alcohol to stimulate microbial activity and/or those that rely on wastewater alcohols from chemical or other manufacturers as a food source for microbes.

Chapter 6: Scenario 4

Chapter 7: Scenario 5 As explained in <u>Chapter 4</u> of this document, there are several conditions that must exist in order for facilities to implement the scenario without triggering RCRA hazardous waste regulations. For example, the wastewater alcohols must be a by-product, must not be a listed hazardous waste, and must be used as an effective substitute for a commercial product. Prior to implementing the scenario, facilities are encouraged to discuss the details of their situation with representatives of the appropriate state or federal regulatory agency.

The remainder of this appendix first provides a summary of the Wastewater Alcohol Reuse scenario. This is followed by a description of the benefits that accrued



Alcohol Reuse scenario. This is followed by a description of the benefits that accrued to the environment, the WWTP, and the chemical manufacturer during the October 1998 implementation of the scenario, and a discussion of the potential benefits from broader implementation of the scenario at the participating facilities.

How the Wastewater Alcohol Reuse Scenario Works

The Wastewater Alcohol Reuse scenario involves a chemical manufacturer, a refinery, and a wastewater treatment plant. The chemical manufacturer and refinery are co-permittees of the WWTP. Although the chemical manufacturer discharges some of its wastewaters to the WWTP for treatment and disposal, it does not discharge its wastewater alcohols from the manufacture of lubricating oil additives. The manufacturer instead transports these wastewater alcohols off-site for disposal. The refinery also discharges wastewaters to the WWTP. Some of these wastewaters contain organics that act as a substrate for the microbes that biodegrade wastewater.

The WWTP must sustain a sufficient level of microbial activity and a healthy population of microbes for biological treatment processes to work effectively. When microbial activity is low, the WWTP typically purchases fresh methanol to increase microbial activity. The WWTP also purchases fresh methanol as a supplemental substrate when there is not enough substrate in wastewaters entering the plant to maintain a healthy population of microbes.

The chemical manufacturer and WWTP can benefit from implementing the Wastewater Alcohol Reuse scenario under two different circumstances. The first is when microbial activity at the WWTP is low, which was the rationale for implementing the scenario in October 1998. Under the Wastewater Alcohol Reuse scenario, the chemical manufacturer discharges wastewater alcohols to the WWTP. The WWTP uses these wastewater alcohols to stimulate microbial activity instead of purchasing fresh methanol. The facilities anticipate that each time they implement the scenario, the chemical manufacturer will discharge 1,000 gallons of wastewater alcohols to the WWTP and the WWTP will avoid purchasing 1,000 gallons of fresh methanol.

The chemical manufacturer and WWTP are also planning to implement the Wastewater Alcohol Reuse scenario during turnaround times at the refinery. During these turnarounds, operations at the refinery shut down and it does not discharge any wastewaters to the WWTP. The WWTP can use wastewater alcohols from the chemical manufacturer to act as the primary substrate for the microbes instead of purchasing fresh methanol. The chemical manufacturer anticipates discharging approximately 30,000 gallons of wastewater alcohols to the WWTP during a turnaround (1,000 gallons per day), allowing the WWTP to avoid purchasing an equivalent quantity of fresh methanol.

Please see <u>Chapter 4</u> of this document for a more detailed description of the scenario.

Benefits of Implementing the Scenario

In October of 1998, the chemical manufacturer and WWTP implemented the Wastewater Alcohol Reuse scenario when cold weather resulted in low microbial activity at the WWTP. The section below describes the observed environmental benefits and cost savings associated with this test scenario. It also presents benefits that would accrue from broader implementation of this scenario at these facilities.

Environmental Benefits

Implementation of the Wastewater Alcohol Reuse scenario benefitted the environment in several ways. Because the WWTP used the wastewater alcohols to stimulate microbial activity in place of methanol, use and therefore demand for production of fresh methanol decreased. This benefitted the environment by reducing the resources used to manufacture methanol and transport it to the WWTP. Reusing the wastewater alcohols also benefitted the environment by decreasing the amount of waste transported from the chemical manufacturer and disposed off-site.

Expanded implementation of the scenario will result in the same environmental benefits. Because the magnitude of these benefits depends upon the quantity of wastewater alcohol reused, the benefits will be significantly larger when the scenario is implemented during turnarounds than when it is implemented to stimulate low microbial activity.

Cost Savings

Exhibit A-2 and the description below present the chemical manufacturer's and WWTP's cost savings from the October 1998 test of the scenario. The WWTP saved \$505 from avoiding the purchase of 1,009 gallons of fresh methanol. The chemical manufacturer saved \$807 in avoided transportation and disposal of 1,009 gallons of wastewater alcohol. Because it incurred an additional \$40 to monitor the transfer of the wastewaters to the WWTP, net savings to the chemical manufacturer were \$767.

	Exhibit A-2 ACTUAL COST SAVINGS FROM TESTING THE WASTEWATER ALCOHOL REUSE SCENARIO October 1998								
	Quantity	Cost Savings	Costs Incurred	Net Savings					
WWTP	Avoided purchase of 1,009 gallons of fresh methanol	1,009	None	\$505					
Chemical Manufacturer	Avoided transportation and disposal of 1,009 gallons of wastewater transferred to WWTP	transportation and	transfers of	\$767					
Total		\$1,312	\$40	\$1,272					

The chemical manufacturer and WWTP plan to implement this scenario on a similar scale four times per year. Thus, the anticipated annual cost savings for the WWTP and chemical manufacturer are approximately \$2,000 and \$3,040, respectively.

The chemical manufacturer and WWTP also plan to implement the scenario during month- long turnaround periods for the refinery. As shown in Exhibit A-3, potential cost savings for the WWTP are \$15,000 from the avoided purchase of 30,000 gallons of fresh methanol during the refinery turnaround. Potential cost savings for the chemical manufacturer are \$24,000 from the avoided transportation and disposal of 30,000 gallons of wastewater alcohol minus \$240 for monitoring the transfer, a net savings of \$23,760.

Exhibit A-3 POTENTIAL COST SAVINGS FROM IMPLEMENTING THE WASTEWATER ALCOHOL REUSE SCENARIO 30-Day Turnaround at the Refinery

	Quantity	Cost Savings	Costs Incurred	Net Savings
WWTP	Avoided purchase of 1,000 gallons of fresh methanol per day* 30 days=30,000 gallons	\$.50 per gallon* 30,000 gallons=\$15,000	None	\$15,000
Chemical Manufacturer		\$.80 per gallon for avoided transportation and disposal* 30,000 gallons=\$24,000	\$8.00 per day for monitoring transfers of wastewater alcohols to WWTP* 30 days=\$240	\$23,760
Total		\$39,000	\$240	\$38,760

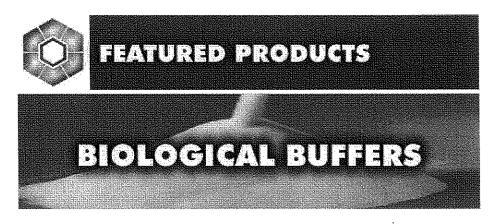
These cost savings are realized only during turnarounds, which occur an average of once every four years. On an annualized basis, the potential cost savings of reusing the wastewater alcohols during turnarounds are \$3,750 for the WWTP and \$5,940 for the chemical manufacturer.

If these facilities implemented this scenario fully, including four times per year to stimulate microbial activity and once every four years during turnarounds, total anticipated annual cost savings would be \$5,750 for the WWTP and \$8,980 for the chemical manufacturer. The potential cost savings for other facilities implementing this scenario depend on how frequently they reuse wastewater alcohols and the quantities that are reused.

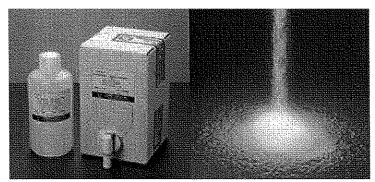
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HEPES, Sodium Salt, GenAR	25 g, 250 g, 10 kg	<u>V165</u>
MES, GenAR	25 g, 100 g	<u>V172</u>
MOPS, GenAR	25 g, 250 g, 10 kg	<u>V087</u>
MOPS, Sodium Salt, GenAR	100 g, 500 g, 10 kg	<u>V289</u>
PIPES, Free Acid, GenAR	100 g, 500 g	<u>V249</u>
PIPES, Monosodium Salt, GenAR	100 g, 500 g	<u>V248</u>
TRIS, GenAR	500 g, 2.5 kg, 5 kg, 10 kg, 12 kg	<u>7732</u>

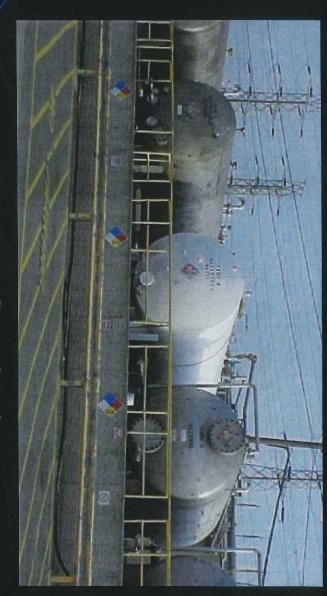
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GenAR	3,		

^{*} Additional sizes available.

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Review of Tank #4 Project



Research Organics, Inc. 4353 East 49th Street Cuyahoga Heights, Ohio 44125

April 24, 2002

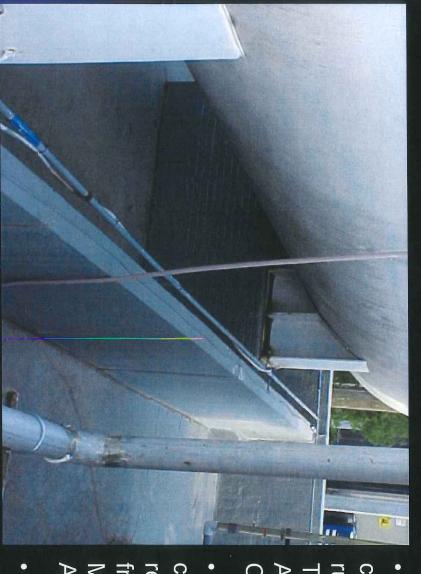
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Tank 4 Certification

- wastes being handled and the materials compatibility. The tank was purchased and installed under the supervision of a degreed Chemical Engineer, who was fully familiar with the hazardous characteristics of the
- The Cuyahoga Heights Fire Department inspected the tank system at the time
- place and was capable of retaining any material that might have leaked At the time the tank was installed in 1998, a cement tank dike system was in
- and in waste water treatment plant operations. The hazardous waste stored in tank 4 can be used for windshield wiper fluid
- Research Organics is a small business, with one environmental staff person. The staff person who failed to identify the need for tank certification is no longer with Research Organics
- As soon as the new environmental staff person became aware of the need for tank certification (in August 1999), HB Engineering was retained to provide the needed assessment. This was before any EPA inspector had identified this problem. It took until June 19, 2001 to obtain the signed certification.
- certification as a non-compliance issue. In fact, a January 2000 Ohio EPA inspection report did not include tank
- Research Organics was, at all times, in compliance with all other Subpart J Tank System requirements, including inspections and recordkeeping.
- The tank has now been fully certified by an independent, qualified, registered professional engineer in accordance with 40 CFR 270.11(d).

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Secondary Containment



- The secondary containment consists of a black rubber liner, concrete, and Techni-Plus AEP 20 (Solids Amine Adduct Cured Epoxy Coating/Lining System)
- The secondary containment is chemically resistant to chemicals coming from the production areas (i.e. Methanol, Isopropanol, Acetic Acid, etc.).
- The secondary containment is visually inspected on a daily basis.

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Emission Controls on Tank



Conservation Valve, Flame Arrester, Duct Work to Control Device

Scrubber

Facility ID: 1318172081 Emissions Unit ID: T004

CIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

.033 py OC emissions, based upon miling, 12-month summation of the nonthly emissions.

Air Permit for Air Source T004



Page 51 of 55
Research Organics
PTI Application: 13-03679
Issued: September 21, 2000

Facility ID: 1318172081 Emissions Unit ID: T004

PART II - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

1	i
Applicable Rules/Requirements	Limitations/Control Measures
	0.033 tpy OC emissions, based upon a rolling, 12-month summation of the monthly emissions.
OAC rule 3745-21-07(D)	exempt, see B.1
	see C.5 and D.5
	Applicable Rules/Requirements OAC rule 3745-31-05(A)(3) OAC rule 3745-21-07(D) NSPS 40 CFR 60 Subpart Kb

2. Additional Terms and Conditions

2.a None

B. Operational Restrictions

- The permittee shall not store any volatile photochemically reactive material in the tank which has a vapor pressure equal to or greater than 1.5 psia under actual storage conditions.
- 2. The scrubber No. 3 shall be operating at all times while the emissions unit is in operation.
- 3. The permittee shall operate scrubber No. 3 with the following restrictions:
 - a. The scrubber flow rate in Tower No. 1 shall be continuously maintained at a value of not less than 120 gallons per minute at all times while the emissions unit is in operation. This will be obtained by having the recirculation valve completely opened and supplying fresh makeup water at value not less than 1.5 gallons per minute.
 - b. The scrubber flow rate in Tower No. 2 shall be continuously maintained at a value of not less than 77 gallons per minute at all times while the emissions unit is in operation. This will be obtained by having the recirculation valve completely opened and supplying fresh makeup water at value not less than 1.0 gallons per minute.

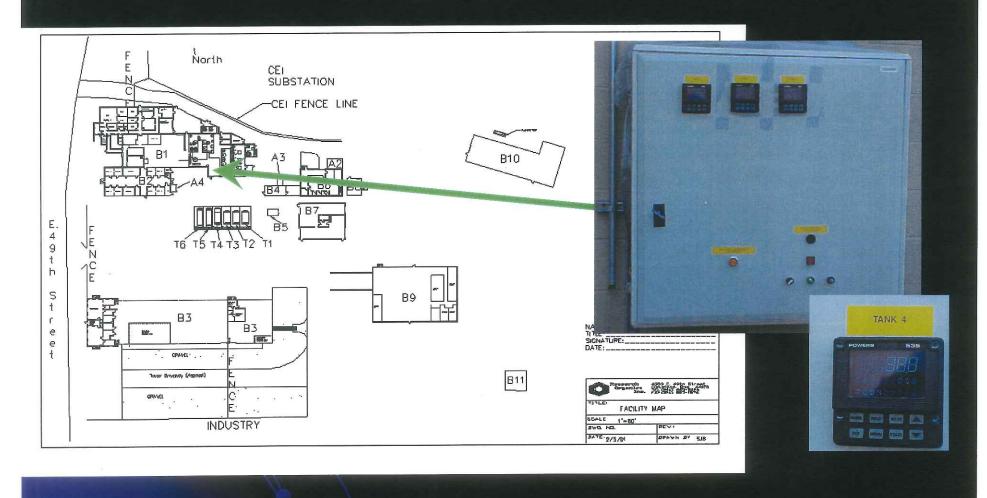
Air Permit for T004

Requires:

- 1.) List of OC material being stored in Tank with volume on monthly basis
- 2.) Vapor pressure of volatile photochemically reactive organic compounds (OC) less than 1.5 psia
- 3.) Collect Scrubber Flow Rates on a Daily Basis.
- Collect Scrubber Pressure Drops on a Daily Basis.
- 5.) Collect Scrubber Temperatures on a Daily Basis.
- 6.) Collect pH on a Daily Basis
- 7.) Monthly emission calculations on a rolling 12-month summation using U.S. EPA TANKS software program.



Controls Located Outside of Large Production on West Wall



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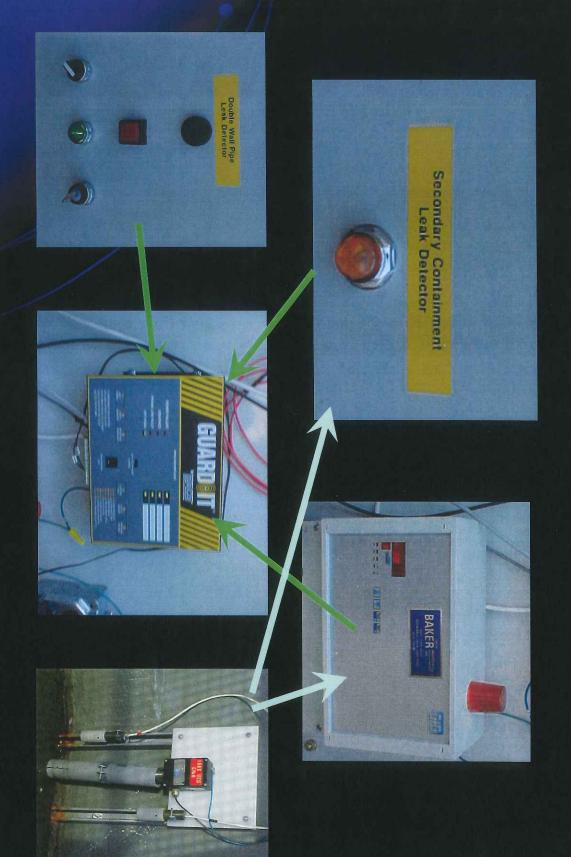
Set Points

 The Level Sensor has a set point of the sensor reaches this volume, the 85.0 percent of total volume. When Production goes on and the valve amber light in the center of Large



closes.

Tank Farm Alarms and Whistles



Daily Inspections

- Daily Inspections include:
 - Tank
 - Secondary Containment
 - Pipes
 - Leak Detection System
 - Level Sensor and Controls
 - Pumps
 - Hoses
 - Valves



4353 East 49th Street * Cityahoga Heights, Ohio 44125 Phone (800) 321-0570 * (216) 883-8025 Fax: (216) 883-1576 * E-Mail: <u>Info@restors.com</u> Internet Web site: <u>Intro@www.rssers.com</u> Technical Service: (800) 334-0144

ROI TANK SYSTEM INSPECTION LOG

Inspector's Full Name	Date	Time	Description of equipment being inspected	Spill/overfill control Equipment in Good Working Order (Yes/No/NA)	No evidence of corresion or release (Yes/No/NA)	Monitoring and leak- detection equipment indicate normal operation (Yes/No/NA)	Evidence of erosion or release in surrounding area or secondary containment structure (dites, etc.) (Yes/No/NA)	Emergency equipment present and in good working order (Yes/No/NA)	Comments
mulal M. comeh	4/12/02	4 30 PM	Timb # 4 + P-gens	yes	14.5	yes	no	yes.	with on Dake
muhal m'Count	4/15/02	820 AN		y.	ye.	Mes	No	y.	water in Dike
Wished M'Commit	4/16/02	130 fr	Tent # 4	The	yu	y's	inte	Yes	
MeanCally	4/17/02	1:30 Am	Tank My	485	Yes	405	No	405	gz.5% Wester in Sump
muchael m'count	4/18/02	830A4	TENER	Yes	yes	yes	Mo	yes.	Water 52.2%
maked Micount	4/19/02	1030x#	Tuk * 4	yes	y.	yes	Νυ	yr	Pape har selvis
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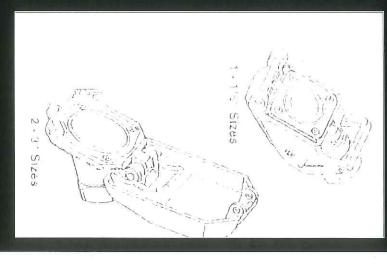
ROI Tank System Inspection Log BO3; Server procedures FORMS/Environforms/tank system inspection logR3.doc 11/01/99 1 VMBT

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Valves and Pumps



Dry Link® - Victaulic Company of America





Pump Controls - Air Driven Pumps

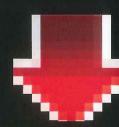


Requires an Operator to Physically Link, Turn On and Turn Off.



SUBPART BB - LEAK DETECTION

- Research Organics operations building. Tank #4. All pumps and valves are located inside the There are five pumps and 15 valves associated with
- The pumps and valves are in full view of ROI professional staff every day. Drip and air leaks would be Recognition limits are far below 10,000 ppm. immediately observed by odor and visual observations.
- do not provide protection from hazardous air emissions not already in place at the facility. covers hazardous air emissions. The Subpart BB rules Research Organics has an Ohio EPA air permit which



Odor Thresholds

- Information obtained from CHEMINFO disc, from Canadian Centre for Occupational Health & Safety (reference citation after the data for each chemical)
- METHANOL, CAS # 67-56-1
- Odor Threshold Values vary widely
- Detection: 4.2-5,900 ppm; geometric mean 160 ppm
- Recognition: 53-8,940 ppm; geometric mean 690 ppm
- Reference: Odor thresholds for chemicals with p. 23, 66 American Industrial Hygiene Association, 1989; established occupational health standards.

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Odor Thresholds continued

ISOPROPYL ALCOHOL, CAS # 67-63-0

Odor Threshold: Values Vary widely

• Detection: 3.3-610 ppm; geometric mean 43 ppm

7.6 – 49 ppm; geometric mean 19 ppm

Recognition:

 References: (1) International Programme on 2-Propanol. World Health Organization, 1990. (2) Chemical Safety. Environmental health criteria 103: occupational health standards. American Industrial Odor thresholds for chemicals with established Hygiene Association, 1989. p.21, 64

Odor Thresholds continued

GLACIAL ACETIC ACID, CAS # 64-19-7

Odor Threshold:

• Detection:

0.037 - 0.15 ppm

• Recognition:

No Data

Reference: Odor thresholds for chemicals standards. American Industrial Hygiene Association, 1989. p. 12, 42 with established occupational health

